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## Business Cycles

DURING THE PAST YEAR the work of the Business Cycle Unit has undergone important changes. At the request of the Planning Committee of the War Production Board, the National Bureau has undertaken to aid in preparing a report upon the characteristics of wartime expansions. Work on this report has been pushed at the sacrifice of other investigations. Another project started during the year is concerned with the interrelations of cyclical movement in consumer incomes, expenditures, and output of consumer goods. We hope that this investigation will prove useful in dealing with postwar problems.

While the outbreak of war has stimulated these additions to our working program, it has forced contraction and adjustments in other directions. Several of our collaborators have entered the government service. As a consequence, work has virtually stopped on the monographs dealing with the cyclical behavior of agricultural production, industrial production, foreign trade, and banking. We have also found it necessary to interrupt the revision of our chronology of business cycles. The revision of the monograph on *Methods of Measuring Cyclical Behavior*, by Arthur F. Burns and Wesley C. Mitchell, is almost completed. This laborious manuscript, so long in the making, will soon be submitted to the Directors for their judgment.

Meanwhile Mr. Mitchell is using the National Bureau's analysis of the cyclical behavior of many time series to ascertain what actually happens in the course of a business cycle. This volume will offer a preliminary summary of our studies since *Business Cycles: The Problem and Its Setting* was published in 1927. Its tentative title is *A Preview of Business Cycles*.

Reports by other participants in the business cycle program follow.

### War Cycles

#### AMERICAN EXPERIENCE

Study of the cyclical behavior of agricultural production was interrupted in February, when I started to supervise the analysis of time series for the Business Cycles staff. At that time a section dealing with the accuracy of crop estimates was practically completed.

Since September I have been occupied with the war cycles study, continuing Isaiah Frank's work. Considerable material for a com-

parison of the cyclical behavior of the economy in war and peacetime was collected, but was set aside in order that some further work on a comparison of industrial production in the United States in 1913-18 and 1937-42 might be done. A memorandum on the latter subject, summarizing the findings of both Isaiah Frank and myself, has been prepared for the War Production Board. At present this report is being revised and will probably be published in the near future as an Occasional Paper.

GEOFFREY H. MOORE

#### FOREIGN EXPERIENCE

At the beginning of the year I was making a critical review of the reference dates selected to mark the peaks and troughs of business cycles in the United States for the period around the turn of the century. I interrupted this task in order to participate in the National Bureau's study of the behavior of production and employment in times of war, concentrating on foreign production and employment.

I began with the study of Germany and England in World War I. The questions that governed the inquiry at this point were: (1) How did total output behave in the course of the war? Did it level off or decline? (2) What were the factors limiting output? As employment data are more abundant than figures on output, and because changes in the size and composition of the labor supply appear to be one of the chief factors limiting output in the course of a long war, I used employment data extensively. Freight traffic statistics were a useful supplement.

The tentative conclusions are that in both countries industrial output declined from the prewar peak in 1913 to the end of the war in 1918. In Germany the decline was very drastic. In England the decline was clear but not so violent. A report written for the War Production Board on the subject is being revised for publication as an Occasional Paper.

I turned next to the study of foreign production and employment in World War II, beginning with a detailed study of employment in Germany. (Employment data were again more plentiful.) In the period of rearmament before 1939 the Nazis achieved an increase in war employment through rapid and complete absorption of the unemployed and very extensive transfer from civilian to war employment; their attempts to increase war employment

through an increase in the aggregate labor force were less successful. For the period since 1939 it is difficult to draw definite conclusions as to the industrial distribution of employment; the most reliable data relate to the aggregate. In the first two years of the war the national labor force, exclusive of the armed forces and exclusive of aliens, declined considerably. Difficulties were experienced in mobilizing female labor. The decline in the national labor force was scarcely made up even numerically by importation of foreign labor. However, it must be remembered that a decrease in the labor force has implications primarily for changes in total output, and that a diminution of total output does not necessarily imply a diminution in the output of armament, ammunition, or even rations for the armed forces. In general, caution must be used in drawing conclusions from the data that are made public concerning the matters that are kept secret.

ALBERT WOHLSTETTER

### *Transportation and Communication*

During 1942 the scope of the transportation study was extended. Our previous inquiries had produced an account of how freight and passenger traffic are affected by business expansions and contractions. Changes in traffic and related changes in revenue affect the character, efficiency, and profitability of railway operations. Accordingly we have analyzed changes in car and train operations, in the productivity of the ingredients of railway service, and in railway costs and profits. The number of ton-miles per car-mile, per train-mile, and per ton of locomotive fuel consumed conforms positively to cycles in freight traffic; so does the ratio of loaded to empty car-miles. Expansion tends to retard and contraction to accelerate the speed of freight trains. These relationships result in part from cyclical changes in the commodity composition of traffic. Passenger miles per car-mile, per train-mile, and per ton of locomotive fuel conform positively to cycles in passenger traffic. We are also studying cyclical changes in the stock of cars and locomotives, in the percentage in serviceable condition, and in the productivity of railroad labor, the relative amount of overtime, the composition of employment, etc.

A special survey of the current expansion in transport has been undertaken. The increase in rail traffic, 1938-42, has been much greater than in 1914-18 or in any intervening expansion, both abso-

lutely and percentage-wise. The course and incidents of the war—the lend-lease and war production programs, the diversion of oil traffic from coastwise to rail transport, the troop movements—have strongly affected the time-pattern of growth. Most of the improvements in productivity ratios to be expected on the basis of experience have materialized, although the abnormal oil movement interrupted the rise in the over-all ratio of loaded to empty car mileage. The unprecedented expansion in traffic raises a question whether the usual improvement in productivity ratios is likely to continue indefinitely; their response to successive increments of traffic is therefore being examined. Information developed in connection with the war study and the general transportation cycles project should have potential value for the appraisal both of the volume of traffic that might result from any specified future production program and of the labor, fuel, and equipment that traffic would require.

These explorations and other tasks have led to the postponement of further work on communications and on transport cycles abroad. A fairly comprehensive and integrated manuscript on American transportation cycles, however, should be available by the middle of 1943.

THOR HULTGREN

### *Inventories*

The spring months of 1942 were spent preparing a draft of a manuscript on the Behavior of Inventories in Business Cycles. This work was virtually completed when I left the National Bureau at the end of May to go to the War Production Board. During the rest of the year I could work on the inventories manuscript only at intervals. Nevertheless, I have been able to revise the first four chapters. The prospects for further work are somewhat brighter as I have arranged for a month's leave from the WPB to start about March 1. I hope it will be possible for me to complete a first revision of the manuscript in that time.

MOSES ABRAMOVITZ

### *Prices*

In our work on prices in business cycles we have in 1942 carried forward studies of the behavior of price, quantity, and value series for important individual commodities. Analytical methods have

been improved and the body of materials has been substantially enlarged. In this work we have had the valuable assistance of J. E. Morton of Knox College who spent the summer months with us. Through his collaboration we have obtained information concerning trade practices bearing on cyclical price and quantity movements, and have improved the technique of study.

Further work has been done on value and quantity aggregates for major economic elements, and on corresponding price averages. In order to study cyclical swings in the monetary flow and in the corresponding physical flow, and the intervening action of prices, we have brought together measurements for series representing payments by business enterprises to one another, payments by consumers to business enterprises, and payments by business enterprises to consumers.

These major studies are pointed toward the continuing problems of economic instability, not primarily toward war and postwar developments. A special study deals with an important aspect of wartime economic organization. For the duration of the emergency, price control legislation and corresponding administrative edicts tend to fix prices, wages, rents, and their interrelationships. There will, of course, be modifications in relationships, but the attempt at stabilization is a move of great economic interest. One of the issues of *Our Economy in War* will, it is planned, deal with the price structure under stabilization. The status of primary producers, manufacturers, distributors, and consumers will be discussed, and the terms of exchange set by the stabilization measures defined. In the discussion of these exchange relations we shall try to take account of some of the broader characteristics of our wartime economy, contrasting these with the attributes of our national economy under peacetime conditions.

FREDERICK C. MILLS

### *Incorporation of Business Enterprises*

The monograph on the incorporation of business enterprises will have about nine chapters and numerous appendices. Of the chapters, six are in first draft form. These present the nature of the study, the significance of an incorporation, an analysis of business charters granted between 1800 and 1875 (a background for the monthly data that follows), a comparison of the changes in the number of incorporations with the authorized capital stock, and a study of the

variations in the number of large, medium, and small business corporations. Something has been written on several of the remaining chapters, which deal with the industrial distribution of incorporations and the relation of the data on charters to business cycles. The work on the appendices, largely the basic tables, is in process. A presentable draft should be available in June.

The whole study is an examination of the nature and the timing of the organizational activities of entrepreneurs. It gives primarily a picture of the 'extensive' phase of the work of this factor of production; that is, it has to do with the number of operating units projected and the industrial fields in which they are expected to function. It does not deal with the 'intensive' aspect of entrepreneurial activities which can more properly be observed in expansions of going concerns.

G. HEBERTON EVANS, JR.  
*Johns Hopkins University*

### *The Consumption and Production of Consumer Goods*

This subject is of more than academic interest at the present time. We can hardly hope to effectuate our dreams of a more ample and stable living after the war without knowing more than we now do about the group of forces bearing on cyclical fluctuations that originate within the consumer goods sector of the economy. More specifically, we need to know, first, the cyclical pattern of consumer saving. Second, if there is a tendency for consumer expenditure to slow down or accelerate relative to consumer income at certain phases of the cycle, we need to know what sorts of commodities are mainly responsible for the changing totals. Third, we need to know how the inevitable irregularities in consumer demand are reflected and amplified in the sales—expectations and inventory policies of business men. These changing expectations and objectives lead to changed production schedules of, and consequently income payments by, consumer goods industries. Any program aiming to stabilize investment ought to be equipped with quantitative as well as functional understanding of this area of consumer-instigated variability.

In line with these needed insights, the study of the consumption and production of consumers' goods has fallen into three main divisions:

- 1) The relation of consumer income to consumer expenditure on

goods and services; that is, the cyclical pattern of consumer saving. In order to ascertain this pattern, it seems essential to make every effort to develop monthly time series for income and expenditure of approximately the same group of people. The application of income-saving ratios, derived from budgetary studies conducted during a given year, to changing aggregate income (variously distributed) is an unsatisfactory device for gauging the role of consumer saving in the business cycle: we know but little of how the distribution of income changes with changing national income; also there is scant reason to believe that income-expenditure patterns, applying to different people at the same time, will apply to the same people at different times—for one thing a man may spend more or less of a given income when it is increasing than when it is decreasing, or more after it has increased for three months than after it has increased for three years. I am hoping that certain monthly time series we are endeavoring to assemble for selected towns will tell an informative story concerning the way people spend changing resources.

2) Variations in the typical patterns of consumption of classes of consumer goods. A preliminary examination of the cyclical timing and amplitude of readily available consumption series and of newly developed series on department store sales for a number of departments suggest that, although retail series tend in general to lag at business turns, this tendency is more pronounced for nondurable than for durable commodities and notably absent in series stated in quantity rather than dollar units. The nature of price and quality changes and their role in generating this pattern calls for careful investigation.

3) The relation of changing retail sales to changing production at various vertically related stages. These relationships have been studied in one industry only, shoe and leather production. There, the usual lag of retail sales behind production becomes a lead when the retail series is converted to a volume (pairs of shoes) basis. Although short leads and lags appear, at several business turns, between retail sales, shoe production, tanning and hide output, the most striking characteristic of these series is their similarity rather than difference in timing; prices also seem to bear a positive, though lagging, relation to production and sales. Inventories in the hands of buyers move with prices, whereas vendors' stocks seem to have an inverse pattern. The statistical picture, unusually com-



plete for the leather industry, challenges the chart reader to recite the story of how the buying and selling movements—which, incidentally, occur not only with the standard business cycle rhythm but also with a more frequent pulse beat, two or three to the cycle—start, spread, and recede. A reading of trade chronology and conversation with men in the industry is helping to block out a picture which, it is hoped, may be sketched within the next few months. The hypotheses constructed in the course of this work will need to be confirmed or rejected by similar studies of other industries. It is unlikely, however, that such studies can be undertaken for some time inasmuch as the first two sections of the work call for completion.

RUTH P. MACK

### *International Financial Transactions*

During the past year we have been able to begin a systematic interpretation of the various statistical series so far collected.

The interrelations of interest rates, interest rate differentials, and exchange rates have been examined in detail. A loose covariation of cycles in different countries is easily established. By itself the confirmation of this familiar fact is not very illuminating; but we have been able to go further and observe certain elements in the mechanism by which fluctuations are transmitted from one economy to another.

The extension of the interpretation into the field of stock markets has revealed the limitation of the statistics and of the currently used techniques of presentation. It has become imperative to proceed to quite detailed studies of the organization of the various exchanges, the trading in international securities, their movements from country to country, etc. We have found that some of the generally accepted indexes of stock prices are not as adequate for our purposes as we originally thought. Since other work seems more urgent than the construction of new indexes, subsidiary material has to be used, of which a great wealth has been discovered. It is now being sifted and will be analyzed in the immediate future.

It is necessary to pay attention also to the 'panics', 'collapses', 'corners', etc. that occurred on various stock exchanges in 1870-1914 and to study their specific properties, which are found to be highly variable. A complete list has been drawn up and is used especially to clarify the role of international securities, which we find to be

the chief transmitters of fluctuations. We also hope to show the influence of purely political events, wars, threats, etc., and the difference among countries in the absorption of their effects. The pattern that emerges is of extraordinary complexity.

The next task will be to relate this field with the others our study covers. By showing the extreme complexity of international financial relations and their continuously shifting character even in times of relative political stability, the study may contribute to a more sober interpretation of the possibilities of a stable postwar economic organization.

OSKAR MORGENSTERN

## Income and Capital Formation

### COMPARISON OF NATIONAL INCOME IN TWO WARS

To compare changes in national income and its composition in this country during the years immediately preceding World War I and the war years proper with the years immediately preceding the present war and the war year already passed, W. I. King's estimates of national income and of its significant components during 1909-18 were placed on a comparable basis with the Department of Commerce estimates for 1934-42. Comparisons of the industrial breakdown and of the distribution by type of income as well as of the global totals are possible.

This work has been completed and the materials are ready for analysis and interpretation. It is hoped that in carrying through this analysis, the work on over-all production and changes in the pattern of production during the same two periods prepared at the National Bureau by Isaiah Frank and Geoffrey H. Moore can also be used.

### SHIFTS IN THE DISTRIBUTION OF INCOME PAYMENTS BY TYPE

Changes in the distribution of income payments by type (wages and salaries, entrepreneurial withdrawals, interest, dividends, etc.), whether cyclical or secular, are due partly to shifts in their shares within industries; partly to shifts in the relative weights of the several industries in the countrywide total of all income payments. The segregation of the changes in the shares of various types of payment in countrywide aggregates due to intra- and inter-industry shifts promises to yield results of considerable interest.